



November: 6-8

All about Food Plants



South Carolina

Farm to School Lessons

Compiled by:
Clemson University Education Coordinators

Lynn R. Adcox, BS
Karen Bunch Franklin, MS
Yenory Hernandez-Garbanzo, PhD

Lesson Support Staff:

Brittney Linton, BS
Ginger Loberger, BS

Advisory Committee:

Katherine Cason, PhD, RD, LD
Kattia Blanco, MS
Sarah Griffin, MPh, PhD
Patsy Smith, MEd
Kristen Welch, MS
Marlyne Walker, MS, RD



Overview

Welcome to the South Carolina Farm to School November Nutrition Education Lesson. This lesson contains information & hands on activities for teaching grades 6-8 about *whole plant foods, specifically fruits & vegetables*. Our goal for this lesson is to help children understand why it is important to eat fruits & vegetables that they can get from supermarkets, farmers markets & gardens close to their home.

In order to achieve this goal, students will explore why whole plant foods are so special & beneficial for our bodies. In addition, students will explore different plants & from these, they will gain an appreciation that they eat many different parts of plants. Students will learn how to make half of their plates fruits & vegetables, & a quarter of their plate with grains. They will remember from the September F2S lesson that these foods should be whole rather than overly processed. To celebrate what they have learned in class, the class will make a salad with the Palmetto Pick of the Month. Students are encouraged to share what they have learned with their families & suggest their families buy & eat more plant-based foods together.

These lessons are designed to be delivered over a four week period, noting that introduction & activities will be supplemental to existing curriculum.

Estimated Total time: 1 hour 15 minutes.

Teacher Background

The focus of this lesson is the importance of having a diet with a strong foundation of whole plant foods. While animal foods are often rich in proteins, vitamins, and minerals, they are also often high in saturated fat and cholesterol. Those substances start clogging blood vessels even in youths and increase the risk of heart attacks as people get older. Plants are truly special. Not only are they essential for all life on earth, but they produce hundreds of natural chemicals, such as vitamins and minerals that help every organ — from our heart to our brain — in our body working right.

The U.S.D.A.'s MyPlate recommends that about three-quarters of our plates be plant foods: half fruits and vegetables and about one-quarter grains, of which at least half should be whole grains. When students have the opportunity to experience whole plant foods with all their senses, as they get to do when they garden, cook, and eat foods from plants, they build their appreciation for eating plants just as they come from nature. Also, since foods from plants often have complex tastes that have bitter and/ or sour flavors, students need to try these foods many, many times to develop a liking for them.

View this lesson as a way to build an appreciation for eating plants, and for students to really believe that when they eat whole foods from plants, they are making choices that are good for their own health and good for the health of the planet.¹

¹ Lesson adapted from Food Day Lessons: Mostly Plants?

Lesson Checklist



F2S Aim: Increase the consumption of South Carolina fresh fruits & vegetables to half of their plate.

F2S Objectives

Students will be able to:

- * Describe how a diet high in plant food & low in saturated fat and cholesterol is good for our health.
- * List the health benefits of eating roots, stems, leaves, flowers, fruits & seeds.
- * Describe how to create a plate that has mostly fruits & vegetables.
- * Prepare a salad using the Palmetto Pick of the Month.



Materials:

- * Plants We Eat cards (will be sent electronically)
- * Plants Parts (Appendix A)
- * Plants Parts We Eat activity sheet (Appendix B)
- * MyPlate Activity sheet (Appendix C), food related magazines, scissors and glue.
- * Salad Grocery list: 1 head lettuce, 7 carrots, 1 turnip, 1 bunch celery, 1/2 bunch of broccoli, 1 pint cherry tomatoes, 8 ounces ready-to eat sunflower seeds, lemon juice, salt and pepper.
- * Kitchen Supplies: cutting boards, plastic knife, 1 spoon to serve dressing, 2 large spoons to toss & serve salad, 5-6 small bowls to hold chopped vegetables, 1-2 bowls to hold the salad, paper plates & forks to serve/eat salad.
- * Gardening Supplies: turnips or lettuce seeds, small plastic bags and soil
- * Gardening journal.



National Health Education Standards

1.8.1	1.8.7	2.8.4	3.8.1	3.8.2
3.8.3	3.8.5	5.8.2	5.8.4	5.8.6
6.8.2	6.8.3	7.8.2	8.8.2	8.8.3

SC State Standards

ELA 7-2.2	Analyze information within and across texts to draw conclusions and make inferences.
ELA 7-2.4	Create responses to informational texts through a variety of methods (for example, written works, oral and auditory presentations, discussions, media productions, and the visual and performing arts).
ELA 7-4.1	Organize written works using prewriting techniques, graphic organizers, and models.
ELA 7-5.2	Create narratives (for example, personal essays or narrative poems) that communicate the significance of an issue of importance and use language appropriate for the purpose and the audience.
ELA 7-5.3	Create descriptions for use in other modes of written works (for example-narrative, expository, or persuasive).
ELA 7-6.4	Use vocabulary (including Standard American English) that is appropriate for the particular audience or purpose.
ELA 7-6.5	Use appropriate organizational strategies to prepare written works, oral and auditory presentations, and visual presentations.
Science 7-2.2	Compare the major components of plant and animal cells.
Science 7-4.2	Illustrate the energy flow in food chains, food webs, and energy pyramids.

Lesson Essential Components

Lessons profile	Page(s)	Yes	No	Notes
Palmetto Pick of the Month	7	★		Cooking & tasting activities with turnips
Health Education Standards	4	★		
SC-Cross Curricular Standards	5	★		
SC-F2S Behavioral Goals	6-7	★		
Cooking Activities	8-9	★		
Tasting Activities	8-9	★		
Physical Activity			★	
Food Safety	8	★		
School Food Garden	8-9	★		
Student to Farmer Connections			★	
Student to Chef Connections			★	
Farm to Cafeteria	8-9	★		
Provision of scientific knowledge/rationale	7-9	★		
Risk and benefits about healthy behaviors	7	★		
Obstacles, Barriers & Solution	8	★		
Family involvement and other supports	8	★		MyPlate Activity & Family Activity Letter
Set goals and monitoring progress	8	★		Action plan to follow MyPlate at the school lunch
Other hands on activities:		★		

Let's Learn!

Explore Why Plants are Special!^{1 2}

Estimated Time: 15 mins

1. Ask the students the following question:
 - If there were no plants in the world, would we have food to eat?
2. Have a class discussion. At first, students might say they can eat food from animals such as milk, cheese, & meat. They might also say they can eat food like candy & cookies. Be sure the students think about what animals eat, & what foods like candy & cookies are made from. Have the students trace different foods back to plants (food chains). For example, eggs come from chickens, & chickens eat grains such as corn & oats. Continue the discussion until you feel your students are convinced that any food they can think of can be traced back to plants.
3. To learn more about food chains, food webs, & energy pyramids, you can view the **Food Chain movie**. Click on "Play the Movie" at <http://magma.nationalgeographic.com/ngexplorer/0309/quickflicks/>
4. After watching the movie, ask students to draw a picture on an index card that represents how nature provides with food. Encourage the use of diagrams, words, & arrows.

Let's Learn!

Discuss Why We Should Eat More Plants Foods & Fewer Animals Foods ¹

Estimated Time: 5 mins

1. Explain to the students that although animal products (meat, eggs, and dairy products) are rich in proteins, vitamins, & minerals, they are often also high in saturated fat & cholesterol. These can clog our blood vessels & increase our risk of heart attacks as we get older. Whereas plant foods are low in saturated fat & rich in dietary fiber, vitamins, minerals, & other potentially beneficial phytonutrients.

Activity

Investigate Various Parts of Plants & Their Nutritional Benefits ²

Estimated Time: 15 mins

1. Project or hold up each of the **Plants We Eat** cards (will be sent electronically).
2. Ask the students to name what plant it is & to point to & name the part of the plant we eat (This activity serves as pre-assessment).
3. Point out that all the plants have roots, stems, & leaves, but only some have flowers, seeds & fruits.
4. Explain that for each of these plants we typically eat only one part. Two examples of plants that are completely edible are the beets & the turnips (*Palmetto Pick of the Month*). You may wish to show pictures of these two completely edible plants.
5. Have students work in six small groups. Assign each group one plant part to read about. (Appendix A)
6. After they have finished reading, give students several minutes to:
 - Name at least two fruits or vegetables that belong to their plant part.
 - Discuss the nutrients people get from eating their part plant.
7. For homework, have students fill in the table on the **Plants Parts We Eat** activity sheet. (Appendix B) Encourage students to ask their family for help. Remind students that the purpose of this activity is to help them appreciate the wide variety of foods we eat from plants. Emphasize that eating all different parts of plants is a great way to get all of the nutrients we need.

Activity

Make Half Your Plate Fruits & Vegetables ^{1,3}

Estimated Time: 15 mins

1. Hand out the **MyPlate** activity sheet. (Appendix C)
2. Have students draw their school lunch from yesterday or today if they have already had school

lunch (This can be used as a self-report dietary assessment).

3. Take a look at the Choose MyPlate activity sheet & have students compare their drawings to this plate.

4. Have the students notice that on MyPlate half the plate is fruits & vegetables because of all the nutrients that are in fruits & vegetables.

5. Ask the students how much of their plates are taken up by fruits & vegetables. Ask them how they feel about trying new fruits & vegetables. What could make it easier? List & discuss the following tips:

- Use fruit as snacks, desserts or salads (*Why is fruit a good dessert choice?*).
- Keep raw, cut-up vegetables handy for quick snacks (*List some veggies you could use for this*).
- Eat red, white, orange, & dark green vegetables, such as tomatoes, turnips, sweet potatoes, & broccoli in main & side dishes (*What are some examples of dishes you like that include these foods?*).
- Choose whole or cut-up fruits more often than fruit juice (*Why is this a good idea?*).

6. Encourage students to fill half of their plate with fruits & vegetables, following the proportions of MyPlate. Snacks of overly processed foods, such as sugary drinks, candy, chips & processed packaged baked goods, are items that we can have once-in-awhile rather than as a regular part of what we eat.

7. Let students cut out food pictures from old magazines, & put the vegetable they like in the vegetable section, a fruit in the fruit section, & a grain & a protein as well. That way, they have a visual of what a plant-based plate looks like filled with foods they like.

8. Encourage the students to share their plate with their families so they can also have plant-based meals.

9. Remind students to get SC Grown fruits & vegetables from their nearest supermarket, farm, garden or farmer's market.

10. Suggest an action plan to follow Choose MyPlate for at least three lunches at school & two dinners in the next week.

★ Palmetto Pick Activity

Cooking Veggie Salad with Crispy Turnips ²

Estimated Time: 15 mins

1. Have students wash their hands (with soap & warm water for 20 seconds) & reinforce that it is important. Show the students that you have washed all the salad ingredients before beginning.

2. Divide the class into 3-5 groups. Give each group some lettuce, carrots, celery, tomatoes, & turnips to cut. This method makes students feel involved in the salad making process. As students are preparing the salad, make the dressing using lemon juice, salt & pepper.

3. You may wish to demonstrate cutting techniques (show different shapes: dices, sticks, slices, stars) & tell the students to be careful with all knives (even plastic knives can hurt people). If you do not feel comfortable having students using a plastic knife, please have ingredients pre-cut before activity.

Note: If you are not comfortable having students cut the vegetables, please either ask parents/volunteers to assist with this activity or pre-cut the vegetables prior to activity.

Ingredients:

- 1 SC locally grown turnip
- 1 head dark green lettuce, such as romaine
- 7 carrots
- 1/2 bunch of broccoli
- 5 stalks of celery (from the bunch)
- 1 pint cherry tomatoes or 7 larger tomatoes
- 8 ounces ready-to-eat sunflower seeds
- lemon juice, salt and pepper

Directions for the students:

- Put in some **LEAVES**: Use your hands to tear the lettuce into bite-sized pieces.
- Put in some **ROOTS**: With the plastic knife, cut the carrots & turnips into slices & bite-sized pieces, respectively.
- Put in some **FLOWERS**: With the plastic knife, cut the broccoli into bite-sized pieces.
- Put in some **STEMS**: With the plastic knife, cut the celery into bite-sized pieces.

- Put in some **FRUITS**: With the plastic knife, cut the tomatoes into bite-sized pieces.
- Place all the ingredients in the salad bowl.
- Put in some **SEEDS**: Sprinkle a small handful of sunflower seeds over the salad.
- Gently toss the salad just until it looks mixed. Be careful to not over-mix, which may damage the vegetables.
- Serve salad on the plate. Add lemon juice, salt & pepper. Enjoy.

Note: Remember, that you can use the Farm to School grant funds to purchase the F&V required for this lesson. Remind your students to look for the Palmetto Pick of the Month in their school lunches to learn other ways of preparing & serving turnips.

★ Gardening Activity

How to Grow Turnips or Lettuce

Estimated Time: 10 mins

Materials Needed:

Pot or Heavy-duty lock-type freezer bag (Pint/Quart)
Turnip or Lettuce seeds
Potting Soil
Water (spray bottle works well)

Directions:

- Fill a pot or plastic bags 3/4 of the way with good potting soil.
- Take a pinch of seeds & sprinkle on the surface of the soil.
- Cover the seeds lightly with soil.
- Water seeds with light spray. If you are using bags, close the bag, leaving one inch open. (Cut off corners of the bag to allow for drainage)
- Set in a sunny window or area.
- When you see little green shoots, open the bag wider so that plants has room to grow & can breathe.
- Your plants need attention & care. You must water them properly & make sure your plants get enough light.

- Lettuce will grow fast in warm temperatures. Ideal temperature is 65-70 degrees F.
- Measure, discuss, describe & record observations in your gardening journal on the growth of your plant.

Note: This activity could be done individually (with items such as pots, plastic cups, gloves or freezer bags) or as a class in the school garden.

Evaluation

Formal Assessment:

1. Review the drawings of food chains.
2. Review the **Plants Parts We Eat** activity sheet (homework).
3. Review Gardening Journal.

Informal Assessment: Observe participation in lesson activities. Ask your students if they ate turnips at the school cafeteria. Complete survey at end of month (survey will be sent electronically).

¹ Adapted from Food Day Lessons (Lesson 2: Mostly Plants).

² Adapted from Growing Food Curriculum (Unit 2: Plants).

³ From Empowering Kids to Choose MyPlate Lesson Plans (Category: Make Half Your Plate Fruits and Vegetables).

Resources



Books:

Growing Food (LIFE 1) developed by educators at Teachers College, Columbia University. You can buy a copy from the following website: <http://www.gardeningwithkids.org/11-3345.html>

Websites:

Empowering Kids to Choose MyPlate Lesson Plan: <http://freemyplate.com/2011/09/13/empowering-kids-choose-myplate-lesson-plans/>

Trade Vegetable Trading Cards: <http://www.agmkt.state.ny.us/f2s/resources.html> A great way to get your students excited about eating vegetables is to collect cool trading cards with exciting facts about why to eat vegetables. Check them out!

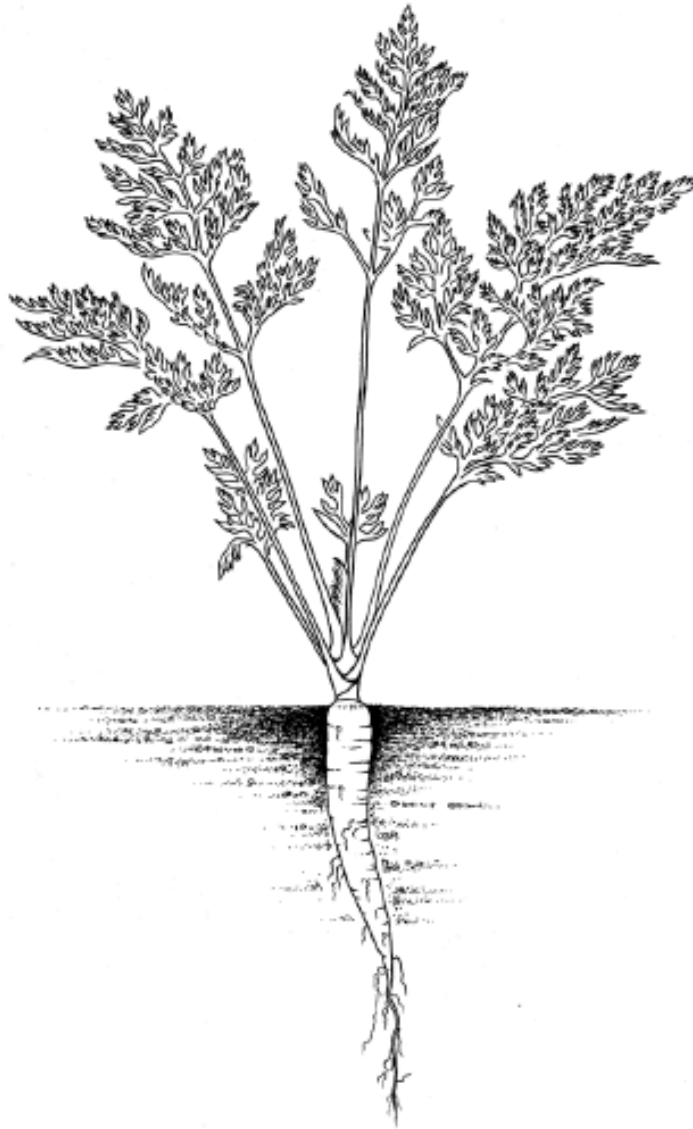
Teach About our Food Production system: <http://blogs.tc.columbia.edu/cfe/education/nutrition-curriculum/growing-food/> Help your students appreciate the food production system by teaching Growing Food, a part of the Linking Food and the Environment (LiFE) Curriculum Series.

Create Art Inspired by Plant-based Foods: <http://www.artandhealthyliving.org/> When we create art, we use observation skills and build appreciation for what we are observing. Use Studio In A School's Art & Healthy Living program as inspiration for your own ideas for connecting eating mostly plants with the creation of art.

Lesson 2: Mostly Plants

— Cards —

Plants We Eat



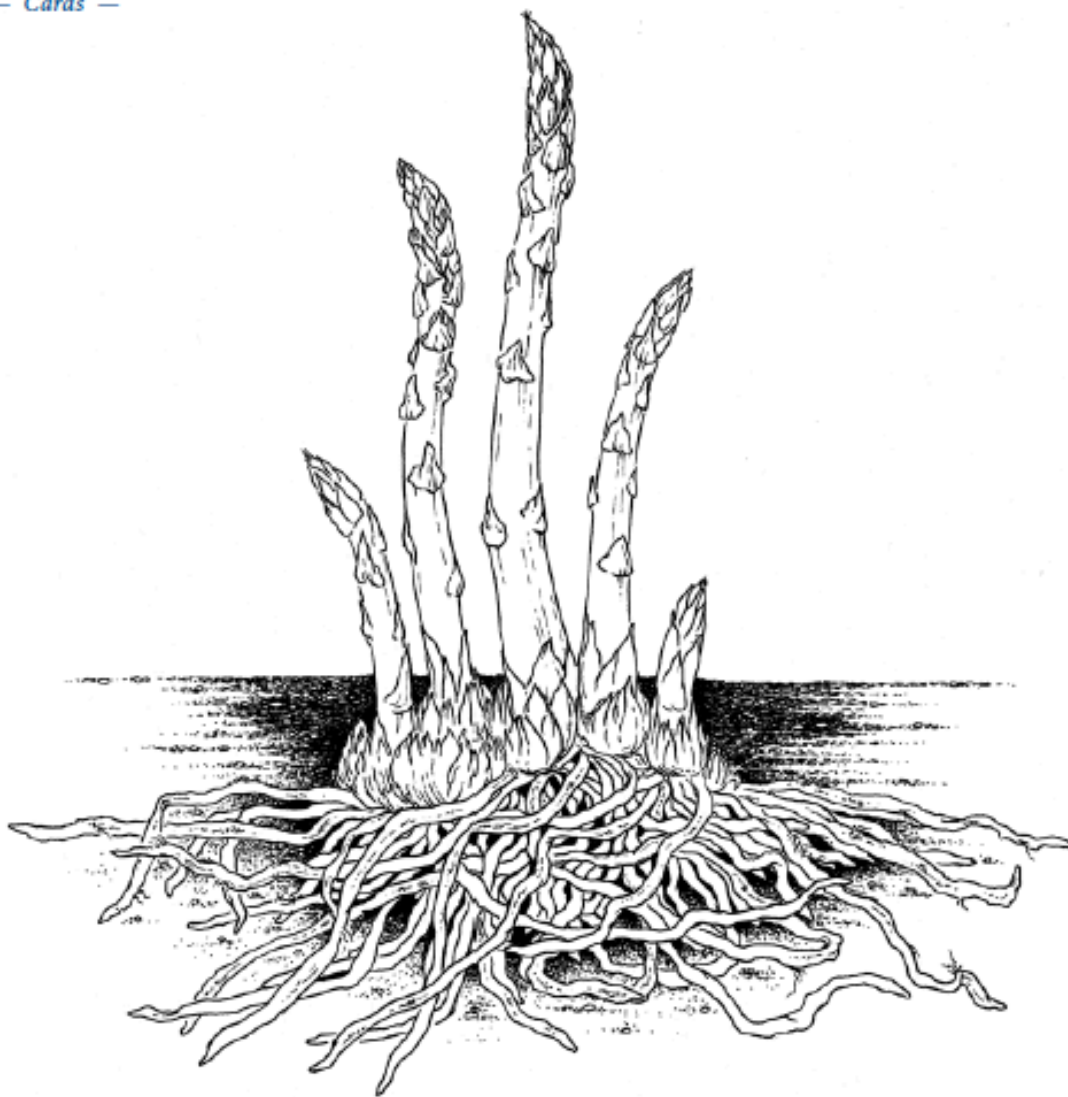
Examples of roots we eat: beet, carrot, cassava, horseradish, lotus root, parsnip, rutabaga, sweet potato, turnip

Nutritional benefits of eating roots: Orange roots, such as carrots and sweet potatoes, are good sources of vitamin A. Vitamin A can help us see well in the dark. Other root vegetables are good sources of fiber and complex carbohydrates, and various phytonutrients that can help every part of our body. For people who live in climates that are cold in the winter, roots are great vegetables to eat all winter long since they can be stored for a long time, are hardy and filling, and are loaded with nutrients we need.

Lesson 2: Mostly Plants

— Cards —

Plants We Eat



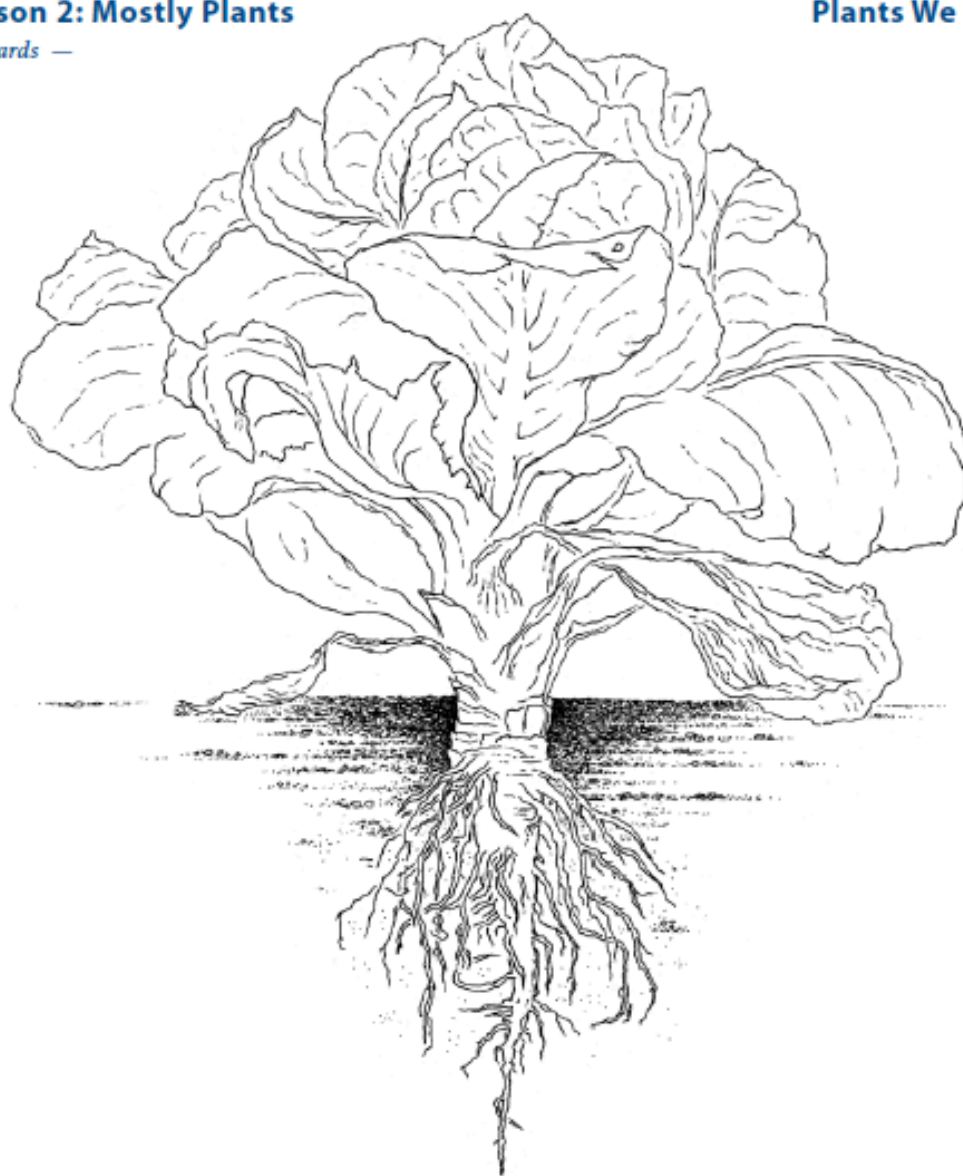
Examples of stems we eat: asparagus, garlic, ginger, white potato. Did you know that garlic and white potatoes are really underground stems of the plant? Garlic is a bulb. Potatoes are tubers that are underground swellings in the stem that store energy and other nutrients for the potato plant. Celery is a stalk, or leaf stem. The true stem of the celery plant is the base where all the stalks come out.

Nutritional benefits of eating stems: Asparagus are one of the first plants that come up in the spring. They are rich in potassium and phytonutrients. Other stems are also rich in these same nutrients.

Lesson 2: Mostly Plants

— Cards —

Plants We Eat



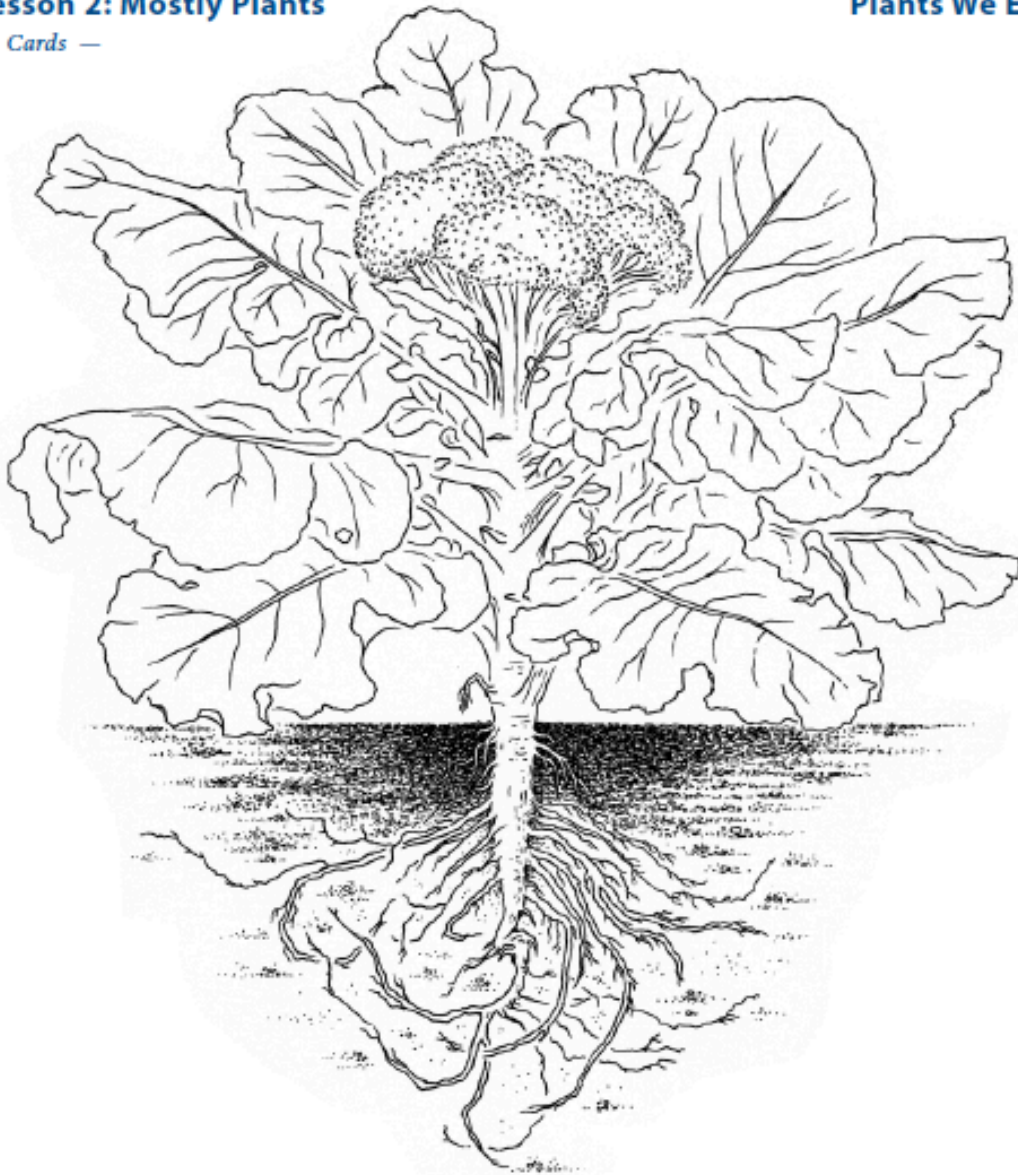
Examples of leaves we eat: basil, beet greens, cabbage, cilantro, collards, kale, lettuce, mustard, parsley, spinach

Nutritional benefits of eating leaves: Leaves are good sources of calcium, iron, many vitamins, and various phytonutrients. The darker green the leaves, the more packed with nutrients. Since leaves are low in calories and high in nutrients, they are one of the most nutrient dense foods we can eat. Leaves are available in the late spring, summer and fall, and might also be available in the winter in warmer climates.

Lesson 2: Mostly Plants

— Cards —

Plants We Eat



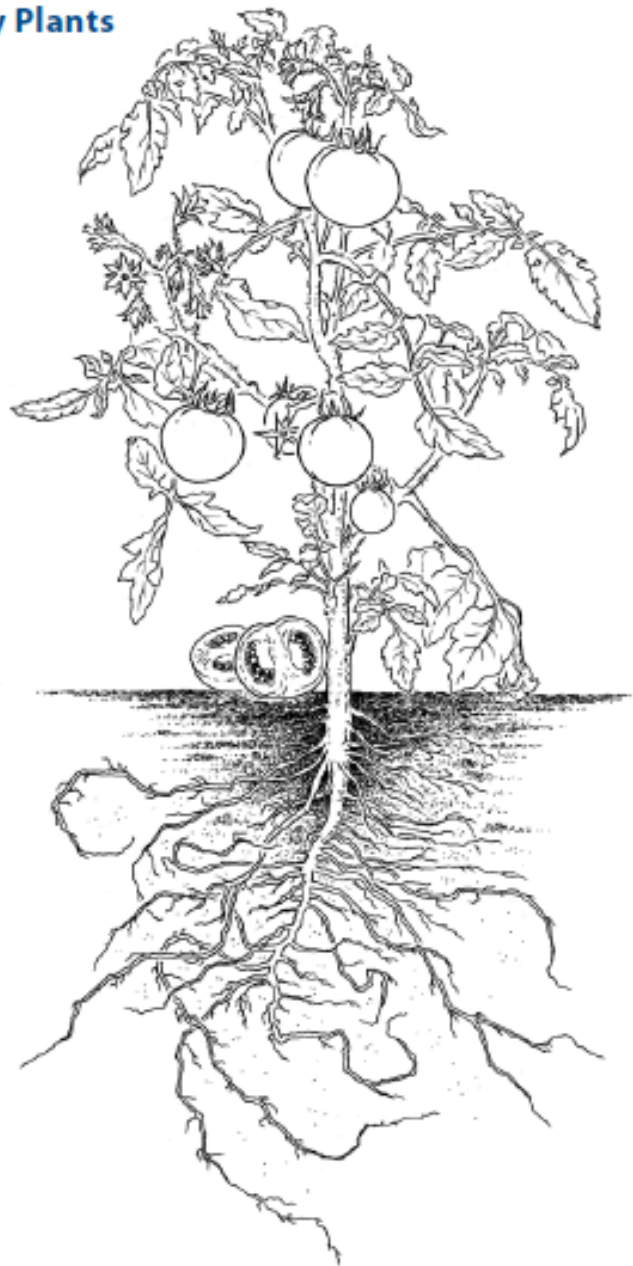
Examples of flowers we eat: borage, broccoli, calendula, cauliflower, chive blossoms, garlic blossoms, nasturtium, squash blossoms, violets

Nutritional benefits of eating flowers: Flowers come in various colors and shapes, and different flowers have different nutrients. Eating flowers can give us the phytonutrients that can help us stay healthy now and prevent diseases in the future.

Lesson 2: Mostly Plants

— Cards —

Plants We Eat



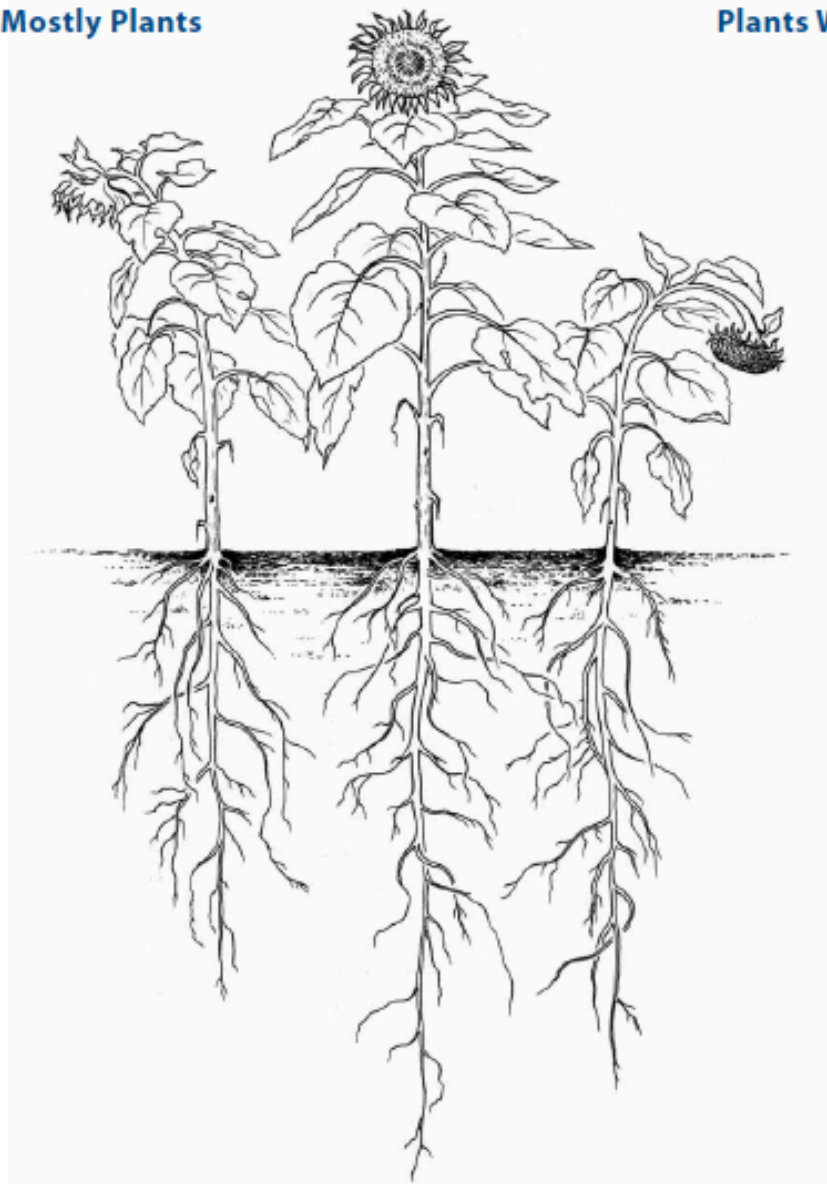
Examples of fruit we eat: vegetables that are the fruit of the plant: cucumbers, peppers, squash, string beans, tomatoes, zucchini; **fruit examples:** apples, blueberries, cantaloupe, grapes, oranges, peaches, pears, plums, raspberries, strawberries, watermelon

Nutritional benefits of eating fruit: Fruits come in so many different colors! Just about all fruits have fiber and complex carbohydrates. Various different colors are rich in different vitamins and phytonutrients. When having fruit, choose a wide variety of colors.

Lesson 2: Mostly Plants

— Cards —

Plants We Eat



Examples of seeds we eat: seeds that are grains: barley, oats, quinoa, rye, wheat; seeds that are good sources of protein: black beans, cashews, chick peas, kidney beans, peanuts, pinto beans, sunflower seeds

Nutritional benefits of eating seeds: Grains are a good source of complex carbohydrates, fiber, and B vitamins. The seeds that are the good sources of protein also have fiber and various phytonutrients. Beans are great as part of a meal, and nuts and seeds can be sprinkled over vegetables and/or grains as the protein part of a meal.

Name:	
Date:	

Roots	Stems	Leaves
Flowers	Fruits	Seeds

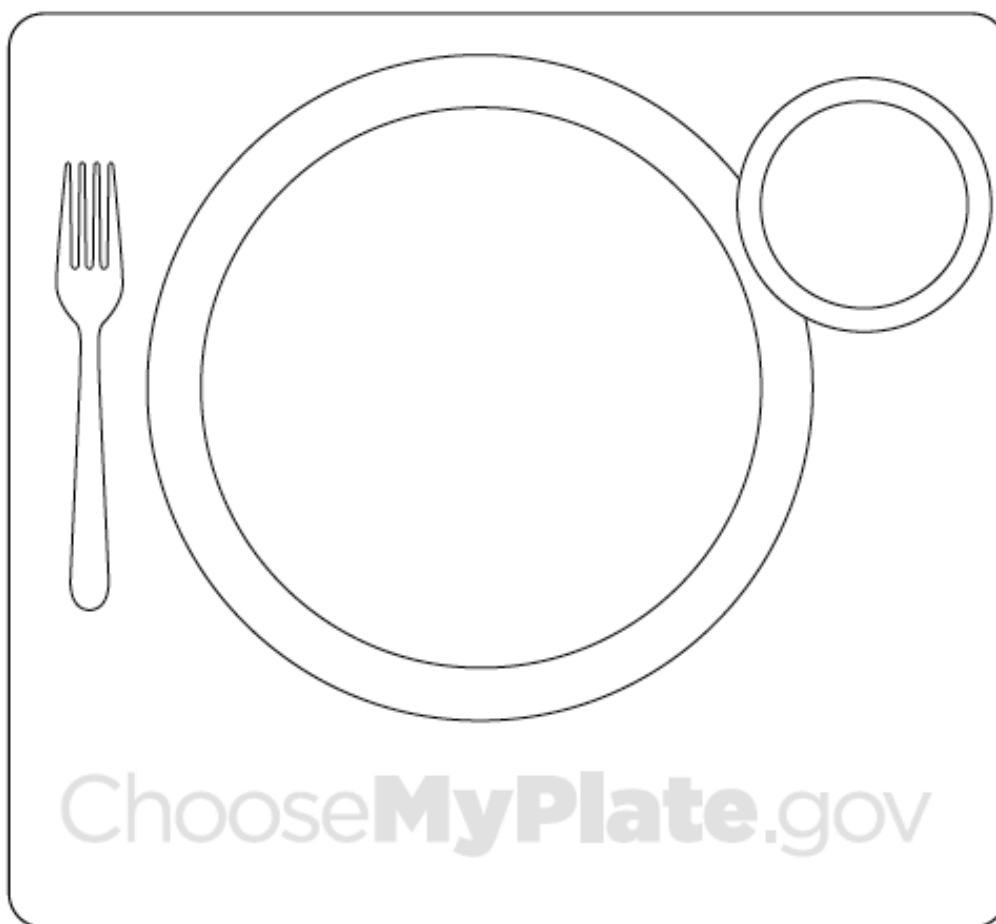
Appendix C (pages 17-18)
MyPlate Activity Sheet

— Activity Sheet —

Name

Date

Below is a picture of a plate and a cup. Draw what you ate and drank for lunch yesterday or today. Think about how much space each item took on the plate and make your drawing as accurate as possible.



Name _____

Date _____

This is MyPlate! When you follow MyPlate, at least three-quarters of your plate is plants. The **amount** you should have in each section is shown. You might fill the Fruit section with apple slices, a peach, or some blueberries. Fill the Vegetables section with carrots, string beans, zucchini, or other vegetables. Fill your Grain section with whole-grain bread, pasta, or brown rice. Your Protein section can consist of animal-based proteins such as chicken, fish, or beef, or plant-based proteins such as beans or tofu. For the Dairy section you can have an 8-ounce glass of lowfat milk, lowfat yogurt, or a piece of cheese.



On the plate below, draw a meal that you would like to eat that follows the amounts shown on MyPlate. Over the next week, try to eat a MyPlate lunch three times at school and a MyPlate dinner two times. Share MyPlate with your family!



Days I followed MyPlate at **school lunch**:

☐ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday

Days I followed MyPlate at **dinner**:

☐ Monday ☐ Tuesday ☐ Wednesday ☐ Thursday ☐ Friday ☐ Saturday ☐ Sunday